



Plate 3—J. R. Ross, Dr. Moren, Sandford Fleming (standing), Geo. M. Grant, Frank Fleming (son). The first overland party through the proposed C. P. R. route to the Pacific Coast in 1872.

Sandford Fleming and his construction of the C. P. R. Before that Railway was built anyone travelling from the Atlantic to the Pacific coast had to go over five or more railroads. If from New York to San Francisco the most used route was via Chicago, Omaha, Denver and Salt Lake City. Each railroad was operated on the central daily time indicated by the Sun's noon-shadow-timed XII in its central city, which might differ from the time used on adjoining but differently owned railways to the East and West, by any range between 35 and 90 minutes.

In New York city-time and six different Railroad times were used. In Chicago there were seven railroad-times differing from City Time by 13 to more than 70 minutes. But as the C. P. R. had to operate nearly 3,000 miles while trains travelled westwards with the Sun, and also eastwards against the apparent Sun, Sandford Fleming divided the Earth's Equatorial circle of  $360^\circ$  by the 24 hours per day, to derive his geographic measure of  $15^\circ$  per hour.

That caused him to recommend that the C. P. R. Divisional stations should be located  $15^\circ$  apart to enable all concerned to simply change their watches one hour as they travelled East or West. By using the map of Canada, he saw that

there were only four hours difference between the Atlantic and the Pacific Sun-times; therefore he advised that four Time Zones should suffice. That is how Canadians derived their one hour changes between Eastern, Central, Mountain and the Pacific Times now used, not only for railway but for all timing purposes.

While Sandford Fleming was using such changes of Time during the years he was constructing the C. P. R., American Railroads quickly saw the practical advantages of that simpler system. Their managers mutually agreed to time their operations from October, 1883, by hour-changing zones. That caused the governing authorities at Washington, D. C., and the State capitols to favour the simplified time.

That extending use encouraged Sandford Fleming to plan for its world-wide use to benefit all humanity. As more than 70 per cent of the world's shipping were then using Greenwich-Time, he tried to induce the British authorities to use that simpler means to time their voyages, but he could not get a hearing. Finally he tried through the British Association, which after 4-years of effort agreed to allow him to read a paper on his Standard Meridian method at their Meeting in Dublin.